

REMARKS

Introduction

In response to the Office Action dated March 25, 2008, Applicants have amended the specification, drawings, and claims 11 and 16. Support for amended claim 11 is found in, for example, Fig. 9 and Paras. [0037], [0087], and [0088] of the published application. The limitations of claims 17 and 18, previously dependent upon claim 16, have been incorporated into claim 16, and claims 17 and 18 cancelled. Support for amended claim 16 is found in, for example, Para. [0037]. Care has been taken to avoid the introduction of new matter. Claims 12, 13, and 17-19 have been cancelled. Claim 24 is withdrawn. In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

Interview Summary

In a telephone interview with Examiner Hoffman on April 8, 2008, the Examiner agreed that the Office Action Summary of the Office Action dated March 25, 2008 incorrectly stated that the period for reply was one (1) month. The Examiner confirmed that the correct period of reply for the Office Action dated March 25, 2008 is three (3) months.

Drawings

The drawings were objected to failing to comply with 37 C.F.R. 1.84(p)(4) because reference character “81” has been used to designate both a towing device and a measuring device in Fig. 15.

Fig. 15 has been amended to label the heater with Reference No. --85--.

Withdrawal of the objection to the drawings is, therefore, respectfully solicited.

Claim Rejection Under 35 U.S.C. § 112

Claims 11-15, 17-19, and 24 are rejected under 35 U.S.C. § 112, second paragraph, as purportedly being indefinite for failing to particularly point out and distinctly claim the subject matter, which the Applicants regards as the invention.

Applicants traverse.

Indefiniteness under the second paragraph of 35 U.S.C. § 112 is a question of law.

Tillotson Ltd. v. Walbro Corp., 831 F.2d 1033, 4 USPQ2d 1450 (Fed. Cir. 1987); *Orthokinetics Inc. v. Safety Travel Chairs Inc.*, 806 F.2d 1565, 1 USPQ2d 1081 (Fed. Cir. 1986). Accordingly, in rejecting a claim under the second paragraph of 35 U.S.C. § 112, the PTO is required to discharge its initial burden for providing a basis in fact and/or cogent reasoning to support the ultimate legal conclusion that one having ordinary skill in art, with the supporting specification in hand, would not be able to reasonably ascertain the scope or protection defined by the claim.

In re Cortwright, 165 F.3d 1353, 49 USPQ 2d 1464 (Fed. Cir. 1999). Consistent judicial precedent holds that reasonable precision in light of the particular subject matter involved is all that is required by the second paragraph of 35 U.S.C. § 112. *Miles Laboratories, Inc. v. Shandon, Inc.*, 27 USPQ 2d 1123 (Fed. Cir. 1993); *North American Vaccine, Inc. v. American Cyanamide Co.*, 28 USPQ 2d 1333 (Fed. Cir. 1993); *U.S. v. Teletronics, Inc.*, 8 USPQ 2d 1217 (Fed. Cir. 1988). Applicants stress that a patent specification must be viewed through the eyes of one having ordinary skill in the art. *Miles Laboratories, Inc. v. Shandon, Inc., supra*.

In applying the above legal tenets to the exigencies of this case, Applicant submits that one having ordinary skill in the art would not have been befuddled by the claimed subject matter.

Moreover, the Examiner's ultimate legal conclusion of indefiniteness ignores the basic legal tenet requiring claims to be interpreted through the eyes of one having ordinary skill in the art in light of and consistent with the written description of the specification. The Examiner failed to even attempt to offer up a reasoned analysis **why** one having ordinary skill in the art would have been confused by the claim language, particularly when reasonably interpreted in light of and consistent with the written description of the specification. *Miles Laboratories, Inc. v. Shandon, Inc., supra*. The rejection is not legally viable for at least this reason. Nonetheless, in order to advance prosecution on the merits, Applicants have amended some of the claims for clarity.

On page 3, the Office Action asserts that “area fraction” is indefinite as to its meaning. The Examiner contends that pg. 16, lines 8-11 of the specification deliberately sets forth a definition for the area fraction of the voids. The Examiner opines that pg. 41 at line 11 gives another definition in the form of an equation and it is not a ratio of the two areas as per the definition found on pg. 16.

Amended claim 11 recites, in part, “...preparing a preform having a plurality of voids whose cross-sectional areas are uniform along the preform axis, *the preform having an initial area fraction of the plurality of voids to cross-sectional area*; drawing the optical fiber from the preform with a fiber drawing furnace, the drawing step includes determining *a resulting area fraction of the plurality of voids in the drawn optical fiber.*”

Applicants submit that in light of the instant disclosure, the present claims are clear and definite to one of ordinary skill in this art. In particular, the Applicants submit that one of ordinary skill in this art would recognize that the claimed resulting area fraction of the plurality of voids is *different* than the claimed initial area fraction of the plurality of voids.

The Office Action states that claim 11 recites feedback control of “time for fiber to pass the fiber drawing furnace” and furnace temperature. The Examiner opines that nowhere is this described and nowhere is any example is given. However, the Office Action states:

[t]he **only disclosure** of this is at pg. 40, lines 21-23. However, there are various passages throughout the specification with striking parallels to what is disclosed [on] page 40, and now claimed (*emphasis added*).

As an initial matter, the Examiner's statement **directly contradicts** the previous statement that nowhere in the specification describes and provides examples of “time for fiber to pass the fiber drawing furnace” and furnace temperature, as lines 21-23 on page 40 provide adequate description.

Further, the Examiner contends that it would appear to one of ordinary skill that these feedback controls all refer back to the same “time,” but it is unclear what that is.

According to the claimed subject matter, the time duration of the fiber in the furnace during the drawing is the length of time to heat the preform (*see, e.g.*, Para. [0035]).

The Examiner contends that the plain meaning of “pass” is along the lines of to move in a path so as to approach and continue beyond something.

Applicants respectfully submit that the rejection is moot in view of the amendment of claims 11 and 16, which deleted the term “pass.”

The Examiner contends that claim 13 is not understood as to what is meant by “a tension during drawings.” The Office Action asserts that it is unclear if it means one tension in each drawing, or that through the course of all of the drawings, only one tension needs to be measured, or something else.

Applicants respectfully submit that the rejection is moot in view of the foregoing amendment cancelling claim 13.

Accordingly, one having ordinary skill in the art would not have difficulty understanding the scope of the presently claimed invention, particularly when reasonably interpreted in light of the supporting specification. Therefore, it is respectfully submitted that the imposed rejection under 35 U.S.C. § 112, second paragraph is not legally viable and hence, Applicants solicit withdrawal thereof.

Claim Rejections Under 35 U.S.C. § 103

Claims 11, 12, and 16-18 are rejected under 35 U.S.C. § 103 (a) Farjardo WO 00/16141 in view of U.S. Patent No. 5,167,684 to Turpin, U.S. Patent No. 6,098,428 to Bogdahn, and U.S. Patent No. 4,793,840 to Harding.

The Examiner contends that the invention is disclosed substantially at least on pages 7-8 of Fajardo. The Examiner avers that Fajardo indicates that the invention is for a fiber that varies in the axial direction and discloses changing the pore volume and air fill fraction as a design variable. The Office Action admits that Fajardo does not explicitly disclose “obtaining an area fraction of the plurality of voids,” or the claimed performing of feedback control. The Office Action asserts that Fajardo discloses controlling pressure during the drawing. The Examiner concludes that since Fajardo teaches controlling pore volume and an air filling fraction, it would have been obvious to measure, calculate, estimate, and otherwise “obtain” these values, so that one can control them.

The Examiner is directed to MPEP § 2144.05(II)(B) under the heading "Only Result-Effective Variables Can Be Optimized," which sets forth the applicable standard for determining result-effective variables:

A particular parameter must first ***be recognized*** as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. (citing *In re Antonie*, 195 USPQ 6 (CCPA 1977)) (emphasis added).

In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to discharge the initial burden by, *inter alia*, making "**clear and particular**" factual findings as to a **specific understanding or specific technological principle** which would have **realistically** impelled one having ordinary skill in the art to modify an applied reference to arrive at the claimed invention based upon facts, -- not generalizations. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolochem Inc. v. Southern California Edison, Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab, supra*; *In re Dembicza*k, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). That burden has not been discharged, as the Examiner has provided no factual basis for alleging that Fajardo determines the resulting area fraction of the plurality of voids based on the initial area fraction of the plurality of voids and the measurements of speeds at which the preform is supplied, the optical fiber is drawn, and a diameter of the optical fiber during drawing, as required by amended claims 11 and 16.

The Office Action states:

It is ***deemed*** that these are different terms for substantially the same ratio. However, ***even if they are completely different fractions, the present claims fail to define over Fajardo-merely because the broadest reasonable interpretation of "area fraction" appears to encompass any conceivable fraction.*** This may seem a bizarre finding, since [the] Applicants [have] clearly and deliberately defined 'area fraction' [on] pg. 16, lines 8-11 as "the ratio of the total area of the voids to the area of the cross section" which occurs "in the cross-section of a preform or a fiber." ***It may seem bizarre that the Office finds that the term is much broader than [the] Applicants' definition – because [the] Applicants [have] the right to be his own lexicographer.*** Examiner finds that [the] Applicants intend a broader scope because [on] page 41 at line 11 gives (sic) another definition in the form of an equation – it is not the ratio of the two areas; it is not the ratio of the two areas as defined on page 16. Examiner understands that the page 41 equation yields [an] useful estimation, but it

is clear that this is not a determination of the an (*sic*) actual area fraction at a specific location. *Since approximations read on the claim, it is deemed that any value/fraction can be an approximation – no matter how well/poorly it approximates it* (*sic*). Fajardo’s “air filling fraction” is a fraction. *One could say it reads on [the] Applicants’ “area fraction,” because it is merely an estimation there of* (*sic*). *It does not matter how well or horribly it estimates it* (*sic*). *It could even have an error of 5000% and horrible correlation. Since [the] Applicants use an estimation of the fraction, one could use Fajardo’s fraction as an estimation* (*emphasis added*).

The Examiner, however, has not established that “obtaining an area fraction of the plurality of voids” and the claimed performing of feedback control are **recognized** result effective variables. Thus, the Office Action is setting forth a motivational rationale not supported by the record, but rather based solely on the Examiner’s belief of what one skilled in the art may have tried or recognized.

However, to set forth a rejection including Official Notice, the rejection must include some form of evidence in the record to support an assertion of common knowledge. If Official Notice is taken of a fact, unsupported by documentary evidence, then the basis for such reasoning must be set forth explicitly. The Examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. *See*, MPEP 2144.03(B) and (C) and 37 C.F.R. 1.104(d)(2). If the Examiner believes that the air filling fraction of Fajardo is the initial area fraction of the plurality of voids, the resulting area fraction of the plurality of voids in the drawn optical fiber based on the initial area fraction of the plurality of voids, and the cross-sectional areas of the plurality of regions made of a sub medium, the Examiner is specifically requested to provide **objective evidence**. Failure to provide objective evidence to support implicit official notice when challenged constitutes ground for reversal. *Ex parte Natale, 11 USPQ2d 1222 (BPAI 1988); Ex parte Nouel, 158 USPQ 237 (Bd.App. 1967).*

It is well settled that “the Board [and the Examiner] cannot simply reach conclusions based on [their] own understanding or experience - or on [their] assessment of what would be basic knowledge or common sense. Rather the Board [and the Examiner] must point to some concrete evidence in the record in support of these findings.” *In re Zurko*, 258 F. 3d 1379, 1386 (Fed. Cir. 2001). *See also, In re Lee*, 277 F. 3d 1338, 1344-45 (Fed. Cir. 2002), in which the court required evidence for the determination of unpatentability by clarifying that the principles of “**common knowledge**” and “**common sense**” may only be applied to the analysis of evidence, rather than be a substitute for evidence.

Contrary to these requirements, the outstanding Office Action provides no sound technical and scientific reasoning to support the above recited Official Notice. The relied upon motion must be evidenced in the record, and cannot be based merely on an opinion of the Examiner.

In the Response to Arguments section, the Examiner contends that the rejection is not based on the measurements of the area fraction of the voids for a fiber and the area fraction of the voids for a preform as being the same. The Examiner opines that the rejection is based on “a rough estimate” for the claimed measurements. The Examiner concludes that the Applicants use an estimate for the area fraction, thus, the prior art can use an estimate as well. The Examiner contends that since the Applicants’ method does not use the true ratio, the prior art need not use the true ratio.

Contrary to the Examiner’s assertions, the claimed subject matter does not use a rough estimate or an estimate for the area fraction. Per amended claim 11, a resulting area fraction of the plurality of voids in the drawn optical fiber is determined by an initial area fraction of the plurality of voids in the preform **and measuring** a speed at which the preform is supplied, a

speed at which the optical fiber is drawn, a diameter of the preform, and the initial area fraction of the plurality of voids in the preform.

Measuring refers to “to find out the size, length, quantity, or rate of something using a suitable instrument or device” (see, Encarta Online Dictionary © 2008 by Microsoft Corporation (copy attached)).

On the other hand, estimating is to “*calculate something roughly*: to make an *approximate* calculation of something” (see, Encarta Online Dictionary © 2008 by Microsoft Corporation (copy attached) *emphasis added*). Contrary to the Examiner’s assertion, the claimed subject matter requires measuring, not estimating. Thus, the Examiner’s conclusion that the prior art need not use the true ratio is *erroneous*.

Fajardo does not measure a speed at which the preform is supplied, a speed at which the optical fiber is drawn, a diameter of the preform, and a diameter of the optical fiber *during the drawing*. All Fajardo does is change the pore volume and air fill fraction as a design variable. As argued above, Fajardo does **not** correlate the resulting area fraction of the plurality of voids in the drawn optical fiber with any of the alleged design variables. There is no basis for **assuming** that controlling the variables in Fajardo would determine a resulting area fraction of the plurality of voids in the drawn optical fiber.

Further, the Examiner contends that one would immediately envision “feedback control” by immediate inference from Fajardo’s discussion of control. The Examiner’s statement *directly contradicts* the previous statement that that since Fajardo teaches controlling pore volume and an air filling fraction, it would have been obvious to measure, calculate, estimate, and otherwise “obtain” these values, so that one can control them. How can controlling pore volume and the air filling fraction in Fajardo be **both** the measurements used to determine the resulting area

fraction of the plurality of voids in the drawn optical fiber and the claimed feedback control? Fajardo fails to disclose or infer, a feedback control, as required by amended claim 11. Fajardo fails to disclose or infer, adjusting a heating condition or a time duration, as required by amended claim 16.

Fajardo fails to disclose or suggest, at a minimum, “...the drawing step includes determining a resulting area fraction of the plurality of voids in the drawn optical fiber, the drawing step comprising the sub steps of: *measuring the speed at which the preform is supplied, the speed at which the optical fiber is drawn, and the diameter of the optical fiber during the drawing; and calculating the resulting area fraction of the plurality of voids in said drawn optical fiber from the value measured in the measuring step, a preform diameter, and the initial area fraction of the plurality of voids in the preform*, wherein the preform diameter and the initial area fraction of the plurality of the voids in the preform are measured before the optical fiber drawing; and *performing feedback control of pressure in the plurality of voids, a furnace temperature and a time duration of the fiber in the furnace during the drawing, based on the resulting area fraction*,” as recited in amended claim 11.

Fajardo fails to disclose or suggest, at a minimum, “...performing feedback control of adjusting a heating condition in a manner in which at least a temperature of a drawing furnace for heating said preform or a time duration of the optical fiber in the drawing furnace is varied based on the resulting area fraction,” as recited in amended claim 16.

The Office Action relies on Bogdahn in an attempt to cure the admitted deficiencies of Fajardo. The Office Action asserts that Bogdahn teaches a method of drawing hollow fibers with very high dimensional accuracy. The Office Action states that Bogdahn teaches calculating the

controlled variable. The Office Action avers that it would have been obvious to use the Bogdahn method for controlling any of the Fajardo controlled variables, such as the air fill fraction.

Although not relied upon to do so, Bogdahn is *silent* regarding determining the resulting area fraction, as required by amended claim 11. Further, Bogdahn is *silent* regarding performing feedback control of pressure in the plurality of voids, a furnace temperature and a time duration of the fiber in the furnace during the drawing, *based on the resulting area fraction*, as required by amended claim 11. Bogdahn fails to disclose or infer, adjusting a heating condition or a time duration, as required by amended claim 16. Thus, Bogdahn cannot cure the deficiencies of Fajardo.

The Office Action relies on Turpin to show it is known to control pressure during fiber drawing.

Although not relied upon to do so, Turpin is *silent* regarding determining the resulting area fraction, as required by amended claim 11. Turpin discusses controlling the pressure during fiber drawing, however, Turpin is *silent* regarding performing feedback control of pressure in the plurality of voids, a furnace temperature and a time duration of the fiber in the furnace during the drawing, *based on the resulting area fraction*, as required by amended claim 11. Turpin fails to disclose or infer, adjusting a heating condition or a time duration, as required by amended claim 16. Thus, Turpin cannot cure the deficiencies of Fajardo and Bogdahn.

The Office Action states that the rest of the limitations of claim 11 and the limitations of claims 12 and 16-18 are met as previously discussed in the October 25, 2007 Office Action. The Examiner contends that even though the exact wording of the claims, especially claims 16-18, was not previously explicitly addressed, the combination of references would clearly cover the invention of claims 12 and 16-18.

As an initial matter, the previous Office Action mailed October 25, 2007 did *not* reject claims 16-21 in view of prior art, only under 35 U.S.C. § 112, first and second paragraph rejections. Thus, the prior art rejection of claims 16-18 was not discussed in the previous Office Action mailed October 25, 2007. Further, as admitted by the Examiner, the instant Office Action does not explicitly address claims 16-18. Further, the Examiner committed clear legal error in ignoring the claim limitations of claims 16-18. The Examiner simply cannot ignore claim limitations. *In re Garnero*, 412 F.2d 276, 162 USPQ 221 (CCPA 1969). Accordingly, the Applicants request that the Examiner issue a new non-final Office Action addressing claims 16-18, in addition to the arguments filed herein.

The only teaching of the claimed method of making an optical fiber is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner's use of unsupported conclusory statements is not legally sufficient to generate a case of *prima facie* obviousness. The motivation for modifying the prior art must come from the prior art and must be based on facts. The Examiner is not free to ignore the judicial requirement for facts. To do so is legal error. *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002). Apparently, the Examiner has relied on improper hindsight reasoning in reaching the conclusion of obviousness.

In the previous Office Action mailed October 25, 2007 with respect to claim 12, the Examiner admitted that Bogdahn and Fajardo do not measure preform speed. The Office Action relies on Harding in an attempt to cure Bogdahn and Fajardo. The Office Action asserted that Harding teaches how to measure the speed due to variations in the preform diameter. The Examiner concluded that it would have been obvious to also monitor and control the preform

speed in accordance with the Harding teachings, so as to compensate for preform variations. The Examiner also concluded that one would be further motivated to measure control as well as every other process parameter so as to maintain a robust process and to aid in troubleshooting whenever problems arise. The Examiner averred that the parameters relating to the fiber draw speed, fiber diameter, preform diameter, and the area fraction of the preform are easily seen in Fajardo.

Although not relied upon to do so, Harding is *silent* regarding determining the resulting area fraction, as required by amended claim 11. Harding discusses controlling the average fiber pulling rate, however, Harding is *silent* regarding performing feedback control of pressure in the plurality of voids, a furnace temperature and a time duration of the fiber in the furnace during the drawing, *based on the resulting area fraction*, as required by amended claim 11. Harding fails to disclose or infer, adjusting a heating condition, as required by amended claim 16. Thus, Harding cannot cure the deficiencies of Fajardo, Bogdahn, and Turpin.

In the Response to Arguments section, the Examiner states he could not find any evidence in the record of unexpected results. Further, the Examiner speculates if it is possible to show any improved results that are truly unexpected.

The Examiner's apparent "absence of unexpected results" approach in attempting to establish a *prima facie* case of obviousness denies Applicants' their right to procedural due process of law. This is because there is absolutely no burden upon Applicants to even offer an argument, let alone the proffer evidence of unexpected results, until such time as the Examiner has discharged his burden of establishing a *prima facie* case of obviousness, which the Examiner has not done. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Rijckaert*, 9

F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

Claims 13 and 19 are rejected under 35 U.S.C. § 103 (a) Farjardo, Turpin, Bogdahn, and Harding, and further in view of U.S. Patent No. 5,961,681 to Tateishi.

Applicants respectfully submit that the rejection is moot in view of the foregoing amendment cancelling claims 13 and 19. Accordingly, the rejection is moot and withdrawal of the rejection under 35 U.S.C. § 103 is solicited.

Claims 14 and 20 are rejected under 35 U.S.C. § 103 (a) Farjardo, Turpin, Bogdahn, and Harding, and further in view of “Toward practical holey fiber technology: fabrication, splicing, modeling, and characterization” (Bennett) and U.S. Patent No. 6,411,762 to Anthon.

Dependent claims 14 and 20 are allowable for at least for the same reasons as independent claims 11 and 16, respectively, and further distinguishes the claimed method of making an optical fiber.

With respect to dependent claim 14, the Office Action asserts that Fajardo creates holes via the stack and draw method. The Examiner contends that Bennett discloses that there are difficulties in fabricating holey fibers. The Examiner avers that Turpin teaches that one can make optical fibers with holes by machining the desired geometry with standard matching processes. The Office Action states that Anthon is cited as showing it is known to use ultrasonic drills to create holes in glass preforms that surround the core portion. The Office Action states,

“[E]xaminer finds this to be a design need or market pressure to solve a problem. There is a finite number of solutions to the problem of making a glass fiber with plural holes running the length. It would have been of ordinary skill and common sense to make holey fibers by making a starting block, and then drawing it down as disclosed in Turpin. It would have been obvious to try to make the Fajardo fibers by drilling a block in the desired pattern.

As argued above, the motivational rationale must be supported by the record, not based **solely** on the Examiner's belief of what one skilled in the art may have tried or recognized.

As none of the references disclose the same method of making an optical fiber as disclosed by the present inventors, and even if combined still fail to disclose or suggest the elements recited by claims 14 and 20, the combination of the cited references do not render the claimed method of making an optical fiber as recited by claims 14 and 20 obvious.

Claims 15 and 21 are rejected under 35 U.S.C. § 103 (a) Fajardo, Turpin, Harding, Bogdahn, Bennett, and Anthon, and further in view of U.S. Patent No. 6,474,108 to Onishi.

Dependent claims 15 and 21 allowable for at least for the same reasons as independent claims 11 and 16, and further distinguish the claimed method of making an optical fiber.

Withdrawal of the foregoing rejections is respectfully requested.

Conclusion

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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